

REMARKS / DISCUSSION OF ISSUES

Claims 1, 3-9, 12-22, 24-30, 33-44, 46, and 48-52 are pending in the application.

Claims 1, 3, 5, 8-9, 14-18, 22, 24, 26-27, 29-30, 35-39, 43-44, and 48-49 are rejected under 35 U.S.C. 103(a) over Malkamaki (USP 6,337,855) and Tellado (USP 6,711,412). The applicants respectfully traverse this rejection.

Each of independent claims 1, 8, 15, 22, 29, 36, and 43 include a supplemental time-varying signal that is added to a data signal and changes frequency during each of a plurality of periods, wherein the frequency changes from one period to a subsequent period in a predetermined sequence of frequencies.

The Office action acknowledges that Malkamaki does not teach that the supplemental time-varying signal that is added to the data signal changes frequency during each of a plurality of periods, wherein the frequency changes from one period to a subsequent period in a predetermined sequence of frequencies, and relies upon Tellado for this teaching.

The Office action asserts that a supplemental signal that comprises a plurality of frequencies that change corresponds to a frequency hopped signal, such as taught by Tellado. The applicants respectfully disagree with this assertion. In a frequency hopping system, there are three signals: the baseband signal, the carrier signal, and the transmit signal. When the carrier signal's frequency changes, the transmit signal's frequency changes; the baseband signal's frequency is unaffected by a change of the carrier signal's frequency. In Tellado, the training signal is the baseband signal. The frequency of Tellado's training sequence does not change when the carrier signal's frequency changes with each hop. As taught by Tellado, the purpose of varying the carrier signal's frequency is to avoid having the training sequence being transmitted on a transmit frequency that exhibits a deep fade or includes strong interference signals.

The Office action asserts that it would be obvious to one of skill in the art to modify the training signal of Malkamaki such that the frequencies of the training signal change in a frequency hopping manner, as taught by Tellado, for the purpose of compensating for deep fading and/or interference. The applicants respectfully disagree with this assertion. Tellado's technique for compensating for deep fading and/or interference does not suggest a training sequence with varying frequencies.

The combination of Malkamaki and Tellado will not lead one of ordinary skill in the art to the applicants' claimed invention. Malkamaki teaches a training sequence that is modulated and added to a modulated data signal. The combined signal is provided to an RF transmitter that transmits the signal at a carrier frequency. Tellado's teaching of varying a carrier frequency would suggest to one of skill in the art to vary the frequency at Malkamaki's RF transmitter, to avoid transmitting the signal on a transmit frequency that exhibits a deep fade or includes strong interference signals. That is, the motivation suggested in the Office action necessarily implies a change to the transmit frequency to avoid deep fades and interference.

One of skill in the art would not interpret Tellado to suggest varying the frequency of a training signal that is added to a data signal using Malkamaki's techniques, because varying the frequency of the training signal that is added to the data signal will not prevent the resultant combined signal from being transmitted on a transmit frequency that exhibits a deep fade or includes strong interference signals. That is, there is no motivation in the prior art to suggest varying the frequency of a training signal that is added to a data signal as asserted in the Office action.

Because the combination of Malkamaki and Tellado does not teach or suggest the elements of each of the applicants' independent claims, and because the motivation asserted in the Office action does not support varying the frequency of a time-varying signal that is added to a data signal, the applicants respectfully maintain that the rejection of claims 1, 3, 5, 8-9, 14-18, 22, 24, 26-27, 29-30, 35-39, 43-44, and 48-49 under 35 U.S.C. 103(a) over Malkamaki and Tellado is unfounded, and should be withdrawn.

In view of the foregoing, the applicants respectfully request that the Examiner withdraw the rejections of record, allow all the pending claims, and find the application to be in condition for allowance. If any points remain in issue that may best be resolved through a personal or telephonic interview, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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